

# **A Care Ethics Analysis of Electronic Fetal Heart Rate Monitoring Malpractices**

STS Research Paper  
Presented to the faculty of the  
School of Engineering and Applied Sciences  
University of Virginia

by

Camila Galavis

April 13, 2024

On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-related Assignments.

ADVISOR

Benjamin J. Laugelli, Assistant Professor, Department of Engineering and Society

## **Introduction**

According to the American College of Obstetricians and Gynecologists, electronic fetal heart rate monitoring (EFM) is used in approximately 85% of all births in the United States, yet its misinterpretation and misuse remain a significant concern, which can contribute to unwanted maternal and fetal outcomes. Fetal monitoring (FM) during labor is a crucial aspect of obstetric care, because it may provide essential information about the overall health of the fetus inside of the womb. Electronic fetal heart rate monitoring continues to be the most used tool in this field, helping healthcare professionals detect any signs of fetal distress that may necessitate medical intervention. However, the effectiveness of EFM is heavily dependent on the correct interpretation and appropriate response by medical staff, which requires a crucial amount of expertise. Unfortunately, instances of malpractice in the use of EFM are not uncommon, leading to adverse outcomes in the patients. There is not really a current approach on how to tackle these adverse outcomes, but the truth is that the medical professionals are not being held correctly accountable for their actions, leading to multiple fetal complications and deaths.

I will be discussing how these malpractices lead to irreversible repercussions in the children, by referring to two cases pertinent to this bigger issue. One such case happened in October of 2003, where the medical staff failed to properly monitor maternal and fetal status. This made the medical staff unable to perform a timely cesarean delivery while also failing to inform the patient of the risks associated with this, causing the baby to endure permanent injuries by withholding him from oxygen for too long. There is another case pertinent to the broader issue in discussion which occurred in 2005, where the incompetent course of action taken by the medical professionals such as neglecting obvious changes in the fetal heart rate led to multiple health repercussions to the birthed child. This research paper aims to investigate the common

malpractices associated with EFM, and analyze their impact on maternal and fetal health outcomes by looking at how doctors have failed to practice attentive and competent care in multiple scenarios of labor and delivery of pregnant mothers, through a Care Ethics lens—a framework that emphasizes the importance of interpersonal relationships and virtues such as care to the needs of others.

## **Background**

The monitoring of fetal heart rate (FHR) is an important method that can help prevent and check the overall well-being of fetuses in the womb. FHR monitoring was first introduced almost 50 years ago, and the technology has not changed significantly since. It has been the way to detect fetuses who are becoming hypoxic –not getting enough oxygen to maintain homeostasis– and to see which course of action– cesarean delivery or operative vaginal delivery– is best for both the mother and the fetus (Kwon & Park, 2016). Electronic fetal monitoring (EFM) has been the *de facto* method to monitor FM, but it seems as it has been proven to not be as safe for many women with low-risk pregnancies (Heelan, 2013). However, it has seemed to improve the outcomes of many fetal conditions aside from hypoxia, such as arrhythmias, and other breathing problems.

## **Literature Review**

There is a lot of research analyzing the malpractices regarding fetal monitoring, especially with electronic fetal monitors (EFM). Most of these vastly discuss the health problems that both the mother and the fetus suffer from. Most of the literature regarding FM malpractices take the stance of the doctors being unable to accurately diagnose what is wrong with the baby inside the womb due to the device itself, but they don't argue the negligence and incompetence

some doctors show, which is why the fetus is found in distress too late. Barrett et al. (1990) discovered that after FM had an increase in the field, around 30% of cesarean sections were unnecessary. Kwon and Park (2016) reiterated this idea, while also considering that there were a lot of inconsistencies among the doctors regarding whether or not to proceed with a cesarean section, and a most definite increase in the rate of cesarean deliveries. In their article *Fetal heart rate monitoring: from Doppler to computerized analysis*, they explain the different methods of EFM that are currently used in the obstetrics and gynecology field, and how these help diagnose compromised fetuses during labor. They also explain the rigorous training medical professionals have to go through, to accurately read and understand the information provided by the EFM. These include the baseline rate and variability, accelerations and/or decelerations, and changes or trends over time, which is why these fetal monitors have to be meticulously interpreted. Failing to understand one of these many criteria could lead to adverse outcomes during labor.

In *System Errors in Intrapartum Electronic Fetal Monitoring: A Case Review*, Miller explains how there are multiple instances in which healthcare professionals have demonstrated incompetent work ethic regarding the attentiveness their patients require of them. Miller does so through a systems approach, which states that when the errors are valid, they are “more likely the result of a complex number of factors, versus the performance failures of single individuals”. In doing so, the approach takes into account different types of failures, which most times diminishes the accountability a person can hold in a given scenario. This article explains that training and education varies widely for the different health providers. It gives us insight on how this could be the cause of the predominance of EFM issues, given the different ways of care involved within each healthcare professional. While the systems approach is good for understanding the basis of the problem and how to find possible solutions, it fails to identify

precisely where accountability lies between the different healthcare professionals, and aims to explain the problem in a series of unavoidable events that ultimately lead to the repercussions in the outcome. Through care ethics, responsibility is able to be determined more accurately and see the failures in the system.

### **Conceptual Framework – Care Ethics**

The thought process and malpractices by health professionals can be thoroughly analyzed through the care ethics framework. Care ethics was developed by Carol Gilligan and Nel Noddings in the 1980s and believes that the development of morals does not come about by learning general moral principles. It believes in recognizing the vulnerability of the other to understand the other's place and emotions, to learn what is good or bad at a particular moment (van de Poel & Royakkers, 2011). Both Gilligan and Noddings asserted the "voice of care" as a good alternative to the "justice perspective" which had been provided by the liberal human rights theory (Sander-Staudt). It stresses the importance of relationships; the mutual responsibility and care people have for each other; it ties the relationships as special responsibilities and moral obligations that we have to attend to different degrees depending on the relationship that we have with the person. Care ethics defines personal relationships as the ones we have with relatives, children, friends, colleagues, as well as those we have within a company, such as between customers, suppliers, employees, etc.

Care ethics emphasizes the significance of compassion, emotion, and the physicality in ethical decision-making, along with the consideration of specific situations. Oftentimes, care ethics is closely related to Aristotle's virtue ethics in the sense that it is sometimes seen as a form of virtue ethics, with care being the main virtue in question. This allows people to see care as a

medium between neglect and dominance/control, while still having the opportunity to put themselves in other's place for understanding. However, it is important to understand that care ethics is not just a type of virtue ethics. It differs from virtue ethics because it concentrates on aspects like social power, identity, relationships, and interdependence, which are unique to care ethics (Sander-Staudt).

There are various stages of care within care ethics, such as caring about, taking care of, caregiving, and care-receiving. These encompass virtues such as attentiveness and responsibility to the person, empathy and compassion, and the competency associated with the course of action taken. Attentiveness and responsibility refer to taking care of someone, by initiating and maintaining caring activities. According to Fisher and Tronto in their essay on the book *Circles of Care*, to take care of someone means “to know enough to predict or try to guess at the outcome of our intervention”, and that assuming responsibility means being accountable for our consequences (Abel & Nelson, 1990). Empathy and compassion are virtues that become some of the pillars in care ethics because they have to do with the ability to understand and share the feelings of another, which is important while caring about, or taking care of someone. Lastly, there is competency, which could be argued to be one of the most important aspects of care ethics; it refers to being able to do a job or task successfully and efficiently, and it relates to the act of caregiving, in which one is actively working towards repairing and maintaining our world (Abel & Nelson, 1990). In hospitals and medical scenes, the medical staff become the caregivers.

This framework focuses on the attention on the relationships between two people, especially if they are asymmetrical such as that between a doctor and a patient. It is important to be aware of the role we play in the different relationships in our lives and how we respond to the different actions we are prompted to do; they determine how much accountability one person has

to take for such actions in a given scenario. A proper attitude in care ethics is defined by having compassion, attention, and being caring, which make people emotionally involved and ultimately hold accountability; thus, it is why we can use this approach to examine the malpractices doctors have been involved with regards to fetal monitoring. Malpractice will then be concluded in the following section based on the inability of the doctor to provide attentive, responsible, and/or competent care to the patients in question.

## **Analysis**

Healthcare professionals are deficient in two key aspects of care ethics and its pillars: attentive, and competent care. Cases of medical malpractice associated with EFM have been an ongoing issue since the beginnings of fetal monitoring. Through two case studies that show different malpractices and the impact it has had on these two families, it can be concluded that the medical staff failed to engage in moral and ethical acting, which caused repercussions in the health of the mother and the fetus. The two fetuses in question suffered catastrophic injuries during labor and delivery, both of whom included hypoxia, metabolic acidosis, perinatal distress, and cerebral palsy amongst others.

### Attentiveness and Responsibility

In the case report *Medical Malpractice Case Report: \$4.5 Million for Failure to Properly Monitor Labor and Fetal Status and Failure to Timely Perform a Cesarean Section*, the healthcare professionals involved in the case failed to engage in attentive and responsible care during the monitoring labor because of the negligence displayed by the defendant nurse midwife when the EFM became non-reassuring after hours in labor (Robins & Kaplan, 2008). This is

evident in the case by seeing that the patient was in labor nearly 12 hours prior to the delivery, in which there was plenty of time to notice the fetus going into distress and being able to make a timely decision regarding the course of action that had to be taken. According to Robins & Kaplan, the firm who took on the case regarding the incident, “the baby was delivered vaginally at 10:43 p.m. with an umbilical cord wrapped twice around his neck, a leading sign that the baby had been hypoxic long before the time of delivery.” Using the correct method of EFM, hypoxia is diagnosable by involving continuous fetal heart rate monitoring with either external ultrasound transducers, or using a cardiotocography (CTG), which is also routinely used to detect fetuses at risk (Cummins et al., 2018).

Furthermore, the plaintiff’s medical expert argued that the fetal heart rate monitoring traces showed evidence of unstable heart rates, ineffective labor patterns within the womb and the fetus, and a decrease in baseline variability, which are all criteria that any medical professional should be trained to accurately read a EFM and be a reliable source (Kwon & Park, 2016). While certified nurse midwives are crucial in any labor and delivery, obstetricians ultimately are the highest medical professional on the case. Given this, it was imperative that at some point before the delivery the nurse midwife consulted an obstetrician on the course of action, especially between the 5 hours prior to the actual delivery. Despite indications of fetal distress, there was a delay in the intervention of either medical professional; there was plenty of time to do so as stated in the case, and a decision performing a cesarean section earlier rather than a vaginal delivery might have prevented the prolonged hypoxia and adverse outcomes the baby had to endure. It was ultimately stated that due to these negligent choices and failure to provide attentive care, the baby was born with neurological conditions that would prevent him from ever leading an independent life.



Care ethics may put into perspective the irresponsible and inattentive care on behalf of the healthcare professionals by highlighting the relational dynamics care ethics proposes. In care ethics, it is crucial to understand the vulnerability of the other end of the relationship, in this case the patients versus the medical staff. Being attentive to the asymmetry of relationships is crucial in care ethics, and in this case, the lack of effective communication and coordination among the different medical staff compromised the quality of care delivered, which in turn had big repercussions. If the medical staff had been more attentive and provided a timely decision, some of the outcomes might have been avoidable and the medical staff would not be deemed as inattentive and irresponsible in this case. Moreover, a core foundation of care ethics relies on the compassion and empathy delivered by either end of the relationship. It is imperative to be aware of the asymmetrical relationship a doctor and a patient share because the patient becomes highly dependent on the doctor during medical emergencies. In this case, the medical staff's untimely response to the needs of the patient demonstrates a deficiency in empathy, as they did not take into account the vulnerability of the patient and the urgency in which they needed help.

### Competency

In the incident described in *System Errors in Intrapartum Electronic Fetal Monitoring: A Case Review*, it is clearly shown how the incompetent care of medical professionals caused severe medical impairments in an unborn child, which the author ultimately identifies as three possible causes: “1) failures in the assessment and treatment of nonreassuring FHR patterns, 2) communication failures, 3) lack of appropriate response by clinicians, and 4) failure to use chain of command to resolve clinical disagreements” (Miller, 2005). The medical professionals failed to provide competent care, which is another one of the pillars of care ethics, as described by

Carol Gilligan. The initial FHR tracing was normal, having a regular baseline rate, and moderate variability. However, during the process of the labor, many of the conversations and medications administered were omitted from the patient chart or between the certified nurse midwife (CNM), registered nurse (RN), and doctors. Afterwards, it was noted that the FHR seemed to be doubling on the Doppler ultrasound and no concerns were shown towards this fact, which shows a clear failure to identify and manage abnormal FHR tracing and the prolonged bradycardia (abnormally slow heart rate) in the fetus. As it was noted by Kwon and Park (2016) in their article, reading fetal monitors is a complicated task, and medical staff should be adequately trained to interpret the data given by the EFM, which is crucial during the labor and delivery of the baby. Both the RN and CNM showed inadequate training and knowledge in interpreting the FHR patterns and data from the EFM, deeming them incompetent to provide sufficient healthcare. All of these events caused massive fetal distress, causing the child to be kept in neonatal intensive care following 5 months after their birth, leaving him completely compromised for the rest of his life.

Medical professionals failed to provide competent care, as evidenced by their inability to correctly interpret FHR tracings, poor communication, and their failure to use the chain of command appropriately. The principles of care ethics were disrupted when the medical staff failed to provide competent care to the patient, which resulted in the child being severely compromised with organ involvement and encephalopathy, consistent with hypoxia whilst in the womb. Care ethics focuses on the relationships between people, the competency, and responsiveness, which the medical staff was not able to comply with. The lack of communication between the RN, CNM, and physician indicates a failure to recognize the interdependence of healthcare professionals within each other and to the patient, which is central to care ethics. Furthermore, the RNs inability to relay information to the physician and the physician's delayed

response shows the incompetence of the medical staff in this urgent situation that lead to big repercussions for the patient. Seeing this through the care ethics lens allows us to see what is unwanted in a medical environment, and how fault has to be distributed amongst the different parties.

As it has been argued and proven that this case study shows a breach of care ethics due to failure to provide competent care in the medical scene by failing to identify abnormal fetal heart beats and taking the best course of action, this same author uses a systems approach to understand the failures regarding the outcome of this case. While it is a good way to explain the case and impart some blame, it becomes a risk management strategy that tries to relay the blame into things such as “the nature of accidents”, and “inadequate knowledge” (Miller, 2005). Although these seem like valid points, using the systems framework reveals a number of identifiable weaknesses, such as poor communication, the nature of accidents, and fear of conflict. These conjoined with one another cause the adverse outcome, and in turn free the medical professionals from taking accountability that should have been addressed to them.

On the other hand, looking at this case study through a care ethics lens allows us to deeply understand the blameworthiness each of the medical professionals had at any given case, and allows us to distribute accountability in such a way that exhibits how each of the parties involved engaged in incompetent care to the patients, which is ethically and morally unacceptable in care ethics. Disrupting the care ethics theory in the relationships of doctor and patient has caused many repercussions in the birth children, which prohibited both children from each of the cases discussed to be able to lead an independent life at any point.

## **Conclusion**

This research paper aimed to emphasize the significance of addressing common malpractices associated with EFM in obstetric care. Instead of putting the blame on the technology, it aimed to discuss the breach of attentive and competent care within the actors, in that case medical professionals, that led to adverse outcomes in two different cases. Both cases discussed highlights of the repercussions inadequate monitoring, delayed interventions, and poor communication and chain of command can cause in the lives of those who depend on us.

Through the lens of care ethics, it is important to distinguish the different relationships people engage in, and how most of the times they are asymmetrical, in which case the actors have to take into account the vulnerability of the other party and put each other in their shoes. There is an ethical and moral imperative for healthcare professionals to deliver patient-centered empathic, attentive, compassionate, and responsible care so as to understand the different conditions and best courses of action. The findings of this paper aim to inform the best practices in the use of electronic fetal monitors, advocating for a better maternal and fetal health through the empathetic care and education care ethics offers. By addressing these issues through a care ethics lens, we can strive to prevent avoidable repercussions and ensure the well-being of the mother and the fetus, while also striving to be moral and ethical actors.

## References

- Abel, E. K., & Nelson, M. K. (Eds.). (1990). *Circles of care: Work and identity in women's lives*. State University of New York Press.
- Arnautovic, T., Sinha, S., & Laptook, A. R. (2024). Neonatal Hypoxic-Ischemic Encephalopathy and Hypothermia Treatment. *Obstetrics & Gynecology*, *143*(1), 67.  
<https://doi.org/10.1097/AOG.0000000000005392>
- Barrett, J. F. R., Jarvis, G. J., Macdonald, H. N., Buchan, P. C., Tyrrell, S. N., & Lilford, R. J. (1990). Inconsistencies in clinical decisions in obstetrics. *The Lancet*, *336*(8714), 549–551. [https://doi.org/10.1016/0140-6736\(90\)92097-2](https://doi.org/10.1016/0140-6736(90)92097-2)
- Bernardes, J., Costa-Pereira, A., Ayres-de-Campos, D., Geijn, H. P. van, & Pereira-Leite, L. (1997). Evaluation of interobserver agreement of cardiotocograms. *International Journal of Gynecology & Obstetrics*, *57*(1), 33–37.  
[https://doi.org/10.1016/S0020-7292\(97\)02846-4](https://doi.org/10.1016/S0020-7292(97)02846-4)
- Cummins, G., Kremer, J., Bernassau, A., Brown, A., Bridle, H. L., Schulze, H., Bachmann, T. T., Crichton, M., Denison, F. C., & Desmulliez, M. P. Y. (2018). Sensors for Fetal Hypoxia and Metabolic Acidosis: A Review. *Sensors (Basel, Switzerland)*, *18*(8), 2648.  
<https://doi.org/10.3390/s18082648>
- Heelan, L. (2013). Fetal Monitoring: Creating a Culture of Safety With Informed Choice. *The Journal of Perinatal Education*, *22*(3), 156–165.  
<https://doi.org/10.1891/1058-1243.22.3.156>
- Krebs, H. B., Petres, R. E., Dunn, L. J., Jordaan, H. V. F., & Segreti, A. (1979). Intrapartum fetal heart rate monitoring: I. Classification and prognosis of fetal heart rate patterns. *American Journal of Obstetrics and Gynecology*, *133*(7), 762–772.

[https://doi.org/10.1016/0002-9378\(79\)90113-3](https://doi.org/10.1016/0002-9378(79)90113-3)

Kwon, J. Y., & Park, I. Y. (2016). Fetal heart rate monitoring: From Doppler to computerized analysis. *Obstetrics & Gynecology Science*, 59(2), 79–84.

<https://doi.org/10.5468/ogs.2016.59.2.79>

Miller, L. (2005). System Errors in Intrapartum Electronic Fetal Monitoring: A Case Review. *Journal of Midwifery & Women's Health*, 50(6), 507–516.

<https://doi.org/10.1016/j.jmwh.2004.09.012>

Robins & Kaplan. (2008). *Medical Malpractice Case Report: \$4.5 Million for Failure to Properly Monitor Labor and Fetal Status and Failure to Timely Perform a Cesarean Section*. [https://www.robinskaplan.com/resources/news/2008/04/medical-malpractice-case-report-4-5-million-for-failure-to-properly-monitor-labor-and-fetal-status\\_\\_](https://www.robinskaplan.com/resources/news/2008/04/medical-malpractice-case-report-4-5-million-for-failure-to-properly-monitor-labor-and-fetal-status__)

Sander-Staudt, M. (n.d.). Care Ethics. *Internet Encyclopedia of Philosophy*. Retrieved February 26, 2024, from <https://iep.utm.edu/care-ethics/>

Van de Poel, I., & Royakkers, L. (2011). *Ethics, technology, and engineering: An Introduction*. Hoboken, NJ: Blackwell Publishing Ltd.